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| 10/501,713  | 07/19/2004  | Volker Hennige       | 254659US0XPCT       | 4451             |
| 22850 7590 06/03/2008<br>OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      |                     |                  |
| EXAMINER  |             |                      |                     |                  |
| COLE, ELIZABETH M   |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 1794  |             |                      |                     |                  |
| NOTIFICATION DATE   |             | DELIVERY MODE        |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/501,713

**Applicant(s)**

HENNIGE ET AL.

**Examiner**

Elizabeth M. Cole

**Art Unit**

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**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-12, 14-22, 24-28, 30-38 and 46-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-12, 14-22, 24-28, 30-38 and 46-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5/8/08
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/17/08 has been entered.

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-36 of copending Application No. 10/504,144, in view of Guiver et al, US Patent Application Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '144 does not set forth the claimed adhesion promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote

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adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '144, motivated by the expectation that this would improve the adhesion of the coating to the substrate.

4. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/524,143, in view of Guiver et al, US Patent Application Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each claims a membrane comprising a fibrous substrate and a permeable ceramic coating. U.S. '143 does not set forth the claimed adhesion promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '143, motivated by the expectation that this would improve the adhesion of the coating to the substrate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/524,669 in view of Guiver et al, US Patent Application

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Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each claims a membrane comprising a fibrous substrate and a permeable ceramic coating. US '669 does not set forth the claimed adhesion promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '669, motivated by the expectation that this would improve the adhesion of the coating to the substrate.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

7. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of copending Application No. 10/519,097 in view of Guiver et al, US Patent Application Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each claims a permeable membrane comprising a fibrous substrate and a permeable ceramic coating. US '097 does not set forth the claimed adhesion promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '097, motivated by the expectation that this would improve the adhesion of the coating to the substrate.

8.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

9. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-29 of copending Application No. 10/575,268 in view of Guiver et al, US Patent Application Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '268 does not set forth the claimed adhesion promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '268, motivated by the expectation that this would improve the adhesion of the coating to the substrate

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of copending Application No. 10/575,759 in view of Guiver et al, US Patent Application Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each claims a membrane comprising a fibrous substrate and a permeable ceramic coating. US '759 does not set forth the claimed adhesion

promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '759, motivated by the expectation that this would improve the adhesion of the coating to the substrate

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. Claims 1, 3-12, 14-22, 24-28, 30-38, 40, 46-48 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 22-42 of copending Application No. 10/575,734 in view of Guiver et al, US Patent Application Publication 20020062737. Although the conflicting claims are not identical, they are not patentably distinct from each other because each discloses a membrane comprising a fibrous substrate and a permeable ceramic coating. US '734 does not set forth the claimed adhesion promoter. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver with the claimed invention of US '734, motivated by the expectation that this would improve the adhesion of the coating to the substrate

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1, 3-12, 14-22, 24-28, 30-31, 33, 40, 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Penth et al, U.S. Patent No. 6,309,545 in view of Guiver et al, US Patent Application Publication 20020062737 and further in view of Silane Coupling Agents, pages 31-32 and 153 and "Inorganic Polymer Engineering Materials". Penth discloses a permeable composite material comprising a fibrous substrate which may be formed from natural or synthetic fibers having a coating disposed thereon. See col. 3, lines 61- col. 4, line 10. The synthetic fibers can be polyamide. The total thickness of the composite material may be 5-150 micrometers. See claim 62. The fibrous substrate can comprise pores or openings having a size of 0.02-500 micrometers which correspond to a minimum value or 20 nm which is within the claimed range. See col. 3, lines 39-60. The coating can comprise metal oxides including those claimed. See col. 6, lines 21-43. The coating can be applied by stamping, pressing, rolling, blade or a brushing, dipping, spraying or pouring. See col. 5, lines 32-36. The inorganic material can comprise a sol comprising the metalloid oxide sol. See col. 5, lines 48-53. The membrane can be bent to a radius of 1 mm without breaking. See col. 2, lines 55-60. The sols are obtained by hydrolyzing at least one metallic compound, at least one metalloid compound or at least one composition metallic compound. It is advantageous to carry out the hydrolysis of the compounds to hydrolyzed with at least half the mol. ratio water, water vapor or ice in relation to the hydrolysable group of the hydrolysable compound. The hydrolyzed compound can be treated



with at least one organic or inorganic acid. Preferably the percentage by mass of the suspended component should be 0.1 to 500 times the hydrolyzed compound used. The suspension consisting of sol and compounds to be suspended preferably has a ratio of sol to compounds to be suspended of 0.1: 100 to 100: 0.1. See col. 5, line 54 0 col. 6, line 65. Penth differs from the claimed invention because it does not disclose the claimed porosity or fiber diameters. However, since Penth teaches employing a porous substrate, and teaches that the porosity of the material can be controlled, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the particular porosity and pore size which produced a membrane having the desired porosity. Since the size of the fibers would be related to the size of the pores, it further would have been obvious to have selected the fiber size through the process of routine experimentation which produced a material having the desired porosity.

Penth differs from the claimed invention because Penth does not disclose the use of adhesion promoters to bond the coating to the fibrous substrate. Guiver et al teaches employing the claimed adhesion promoters in order to promote adhesion between a polymeric substrate and an inorganic coating. See abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed an adhesion promoter as taught by Guiver in the invention of Penth, motivated by the expectation that this would improve the adhesion of the coating to the substrate. As to claims 41, 42, 45, Penth teaches one or more further coatings can be applied such as an inorganic or ceramic layer. See col. 7, lines 56-col. 8, line 16. With regard to the limitation that an adhesion promoter is present, since Guiver teaches including an adhesion promoter to facilitate bonding, it would have been obvious to do so, with the expectation that the adhesion promoter would further facilitate bonding between the

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components. Further, "Inorganic Polymer Engineering Materials" (copy attached) teaches that the claimed glycidyoxytrimethoxy silane is a known and conventional silane coupling agent which is used to facilitate bonding between inorganic materials and polymers. See page 21.

With regard to the limitation that the substrate consists of one or more of the claimed polymeric fibers, Penth teaches that the substrate can be a polyamide nonwoven, therefore, Penth meets this limitation. It is noted that the claims do not preclude additional layers or coatings being applied to the substrate, but only require that the substrate consist of one of the recited types of nonwoven fabrics.

14. Although Guiver teaches the use of silane coupling agents, it does not teach the specifically claimed silane coupling agents. "Silane Coupling Agents", page 153 teaches using conventionally known silane coupling agents to facilitate bonding between ceramics and other components. "Silane Coupling Agents", pages 31-32 teach the claimed silane coupling agents as being conventionally used. See table 2.1. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the particularly claimed silane coupling agents to facilitate bonding in the invention of Penth, motivated by the teaching of Silane Coupling Agents of their suitability for this purpose. .

15. Claims 32,34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Penth in view of Guiver and further in view of Silane Coupling Agents, pages 31-32 and 153 and "Inorganic Polymer Engineering Materials" as applied to claims above, and further in view of Sassa et al, U.S. patent No. 5,324,579. Penth differs from the claimed invention because while Penth teaches that the fibers may be "plastic" fibers generally, and teaches polyamide fibers

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specifically, Penth does not disclose the other particularly claimed fibers. Sassa et al teaches that fibers such as PTFE, may be combined with other types of synthetic plastic fibers including polyesters, polyamide, polyolefins, polyimide and polyacrylonitrile fibers in order to form substrates which are used to form filter materials. See col. 5, line 56-col. 6, line 56. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed the polymeric fiber materials disclosed in Sassa in the invention of Penth, motivated by the teaching of Sassa that the other polymeric fibers were recognized in the art as equivalent to the polyamide fibers specifically taught by Penth and also because of the art recognized suitability of such fibers for the purpose of making substrates for filtration.

16. Applicant's arguments filed 4/17/08 have been fully considered but they are not persuasive. Applicant argues that "Silane-Coupling Agents" teaches away from the use of silane with glycidoxo or methacryloxy substituents on silicone are not useful as coupling agents. However, the reference further goes on to state that "An exception may be found in functional alkoxy silanes having a negative substituent on the second carbon of the alkoxy group. Reaction products of glycidyl methacrylate with chlorosilanes contain a  $\text{SiOCH}_2\text{CHClCH}_2\text{Y}$  (Y=methacryloxy) linkage that contributes very creditable water resistance to reinforced polyesters." Further, "Inorganic Polymer Engineering Materials" (copy attached) teaches that the claimed glycidyoxytrimethoxy silane is a known and conventional silane coupling agent which is used to facilitate bonding between inorganic materials and polymers. See page 21. Therefore, while "Silane Coupling Agents" does teach that not all silane with glycidoxo or methacryloxy substituents are useful as coupling agents, both "Silane Coupling Agents" and "Inorganic Polymer Engineering Materials" teach that the particularly claimed silane coupling

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agents were known in the art as being useful as silane coupling agents which facilitate bonding and adhesions and therefore, it would have been obvious to one of ordinary skill in the art to have employed the known material for its known purpose of promoting bonding and adhesions.

17. Applicant argues that Penth teaches at col. 2, lines 20-22 that the constituent is one that "essentially contains a compound consisting of a metal and at least one element from group III to VII of the periodic system at col. 2, lines 20-22 of Penth. However, col. 2, lines 20-22 of Penth do not appear to include this statement. Penth at col. 2 teaches "The present invention likewise provides a reanerable gas filter which comprises a composite material which is obtainable by application of a suspension which comprises at least one inorganic component comprising a compound of at least one metal, a semimetal or a mixed metal with at least one element of main groups III to VII and a sol to an open-structured and material-permeable support and by subsequent heating at least once during which the suspension comprising at least one inorganic component is solidified on or in or on and in the support", (Penth, col. 2, lines 17-26). Thus, Penth does not disclose or claim the invention using "closed" claim language and does not preclude the addition of additional components. Therefore, this argument is unpersuasive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth M. Cole whose telephone number is (571) 272-1475. The examiner may be reached between 6:30 AM and 6:00 PM Monday through Wednesday, and 6:30 AM and 2 PM on Thursday.

The examiner's supervisor Rena Dye may be reached at (571) 272-3186.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information

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for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

The fax number for all official faxes is (571) 273-8300.

/Elizabeth M. Cole/  
Primary Examiner, Art Unit 1794

c.m.c